# PMP® Formula Pocket Guide

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## Earned Value

CV = EV - AC
CPI = EV / AC
SV = EV - PV
SPI = EV / PV
EAC *'no variances'* = BAC / CPI
EAC *'fundamentally flawed'* = AC + ETC
EAC *'atypical'* = AC + BAC - EV
EAC *'typical'* = AC + ((BAC - EV) / CPI)
ETC = EAC - AC
ETC *'atypical'* = BAC - EV
ETC *'typical'* = (BAC - EV) / CPI
ETC *'flawed'* = new estimate
Percent Complete = EV / BAC * 100
VAC = BAC - EAC
EV = % complete * BAC

## PERT

PERT 3-point = (Pessimistic+(4*Most Likely)+Optimistic)/6
PERT σ = (Pessimistic - Optimistic) / 6
PERT Activity Variance = ((Pessimistic - Optimistic) / 6)^2
PERT Variance all activities = √sum((Pessimistic - Optimistic) / 6)^2

## Network Diagram

Activity Duration = EF - ES + 1 or Activity Duration = LF - LS + 1
Total Float = LS - ES  or  Total Float = LF – EF
Free Float = ES of Following - ES of Present - DUR of Present
EF = ES + duration - 1
ES = EF of predecessor + 1
LF = LS of successor - 1
LS = LF - duration + 1

## Project Selection

PV = FV / (1+r)^n
FV = PV * (1+r)^n
NPV = Formula not required. Select biggest number.
ROI = Formula not required. Select biggest number.
IRR = Formula not required. Select biggest number.
Payback Period = Add up the projected cash inflow minus expenses until you reach the initial investment.
BCR = Benefit / Cost
CBR = Cost / Benefit
Opportunity Cost = The value of the project not chosen.

## Communications

Communication Channels = n * (n-1) / 2

## Probability

EMV = Probability * Impact in currency

## Procurement

PTA = ((Ceiling Price - Target Price) / Buyer's Share Ratio) + Target Cost

## Depreciation

Straight-line Depreciation:
Depr. Expense = Asset Cost / Useful Life
Depr. Rate = 100% / Useful Life
Double Declining Balance Method:
Depr. Rate = 2 * (100% / Useful Life)
Depr. Expense = Depreciation Rate * Book Value at Beginning of Year
Book Value = Book Value at beginning of year - Depreciation Expense
Sum-of-Years' Digits Method:
Sum of digits = Useful Life + (Useful Life - 1) + (Useful Life - 2) + etc.
Depr. rate = fraction of years left and sum of the digits (i.e. 4/15th)

## Mathematical Basics

Average (Mean) = Sum of all members divided by the number of items.
Median = Arrange values from lowest value to highest. Pick the middle one. If there is an even number of values, calculate the mean of the two middle values.
Mode = Find the value in a data set that occurs most often.

## Values

1 sigma = 68.26%
2 sigma = 95.46%
3 sigma = 99.73%
6 sigma = 99.99%
Control Limits = 3 sigma from mean
Control Specifications = Defined by customer; looser than the control limits
Order of Magnitude estimate = -25% to +75%
Preliminary estimate = -15% to + 50%
Budget estimate = -10% to +25%
Definitive estimate = -5% to +10%
Final estimate = 0%
Float on the critical path = 0 days
Pareto Diagram = 80/20
Time a PM spends communicating = 90%
Crashing a project = Crash least expensive tasks on critical path.
JIT inventory = 0% (or very close to 0%.)
Minus 100 = (100) or -100

## Acronyms

AC    Actual Cost
BAC   Budget at Completion
BCR   Benefit Cost Ratio
CBR   Cost Benefit Ratio
CPI   Cost Performance Index
CV    Cost Variance
DUR   Duration
EAC   Estimate at Completion
EF    Early Finish
EMV   Expected Monetary Value
ES    Early Start
ETC   Estimate to Complete
EV    Earned Value
FV    Future Value
IRR   Internal Rate of Return
LF    Late Finish
LS    Late Start
NPV   Net Present Value
PERT  Program Evaluation and Review Technique
PTA   Point of Total Assumption
PV    Planned Value
PV    Present Value
ROI   Return on Investment
SPI   Schedule Performance Index
SV    Schedule Variance
VAC   Variance at Completion
σ     Sigma / Standard Deviation
^     "To the power of" (2^3 = 2*2*2 = 8)

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